

ABSTRACT

The present invention provides nucleotide sequences and corresponding amino acid sequences for plant cytokinin oxidase proteins. Also provided are vectors, host cells, and transgenic plants comprising such sequences as well as [[relates to]] methods for stimulating root growth and/or enhancing the formation of lateral or adventitious roots and/or altering root geotropism comprising using such sequences expression of a plant cytokinin oxidase or comprising expression of another protein that reduces the level of active cytokinins in plants or plant parts. Also provided by the present invention are methods for altering various plant phenotypes including increasing seed size and/or weight, embryo size and/or weight, and cotyledon size and/or weight using cytokinin oxidase proteins and/or nucleic acid molecules encoding cytokinin oxidase. The methods comprise expression of a plant cytokinin oxidase or expression of another protein that reduces the level of active cytokinins in plants or plant parts.

The invention also relates to novel plant cytokinin oxidase proteins, nucleic acid sequences encoding cytokinin oxidase proteins as well as to vectors, host cells, transgenic cells and plants comprising said sequences. The invention also relates to the use of said sequences for improving root related characteristics including increasing yield and/or enhancing early vigor and/or modifying root/shoot ratio and/or improving resistance to lodging and/or increasing drought tolerance and/or promoting in vitro propagation of explants and/or modifying cell fate and/or plant development and/or plant morphology and/or plant biochemistry and/or plant physiology. The invention also relates to the use of said sequences in the above mentioned methods.

The invention also relates to methods for identifying and obtaining proteins and compounds interacting with cytokinin oxidase proteins. The invention also relates to the use of said compounds as a plant growth regulator or herbicide.